

electrical connection to the third connector **851**, a third switching device **S3** for switching electrical connection to the battery **1000**, an inductor **L** having one end connected to the third switching device **S3**, and a power conversion switching device **Sa** having one end connected to the inductor **L**.

[0085] The power supply device **800** may further include a power generator **820** for generating an AC voltage waveform, a fourth switching device **S4** having one end connected to the power generator **820**, and a fifth switching device **S5** having one end connected to the first connector **350**.

[0086] The controller **870** may output switching signals **Ss1** to **Ss5**, **Ssa** for controlling switch operations of the first to fifth switching device **S1** to **S5** and the power conversion switching device **Sa**.

[0087] If the first switching device **S1** and the fifth switching device **S5** are turned on, the input AC voltage may be supplied to the grid via the second connector **805** as the first output AC voltage.

[0088] If the third switching device **S3** is turned on and the first switching device **S1** is turned on, the second DC voltage stored in the battery **1000** may be converted into an AC voltage and the converted AC voltage may be supplied to the grid via the second connector **805** as the first output AC voltage.

[0089] If the first switching device **S1** and the third switching device **S3** are turned on, the AC voltage from the grid is converted into a DC voltage, and the converted DC voltage may be supplied to the battery **1000** via the fourth connector **807**.

[0090] If the fifth switching device **S5** and the second switching device **S2** are turned on, the input AC voltage may be output to the third connector **851** as the second output AC voltage.

[0091] Thus, when the plug of the home appliance **900a** is connected to the third connector **851**, the home appliance **900a** may be driven by the power supply device **800**.

[0092] In particular, when power outage occurs, the fifth switching device **S5** and the second switching device **S2** are turned on. Thereby, the home appliance **900a** connected to the third connector **851** may be driven by the power supply device **800**.

[0093] If the fifth switching device **S5** and the third switching device **S3** are turned on, the input AC voltage may be converted into a DC voltage, and the converted DC voltage may be output supplied to the battery **1000** via the fourth connector **807**.

[0094] Thereby, when grid power outage occurs, the DC voltage may be stored in the battery **1000**.

[0095] If the third switching device **S3** is turned on, and the second switching device **S2** is turned on, the second DC voltage stored in the battery **1000** may be converted into an AC voltage, and the converted AC voltage may be output to the third connector **851** as the second output AC voltage.

[0096] Thereby, if the plug of the home appliance **900a** is connected to the third connector **851** during grid power outage, the second switching device **S2** may be driven by the power supply device **800**.

[0097] FIGS. 6A to 6F illustrate various operations of the power supply device of FIG. 5.

[0098] FIGS. 6A to 6C illustrate operation of a power conversion device **800** in a normal situation in which grid power outage does not occur.

[0099] As shown in FIG. 6A, if the first switching device **S1** and the fifth switching device **S5** are turned on, the input AC voltage may be supplied to the grid via the second connector **805** as the first output AC voltage.

[0100] As shown FIG. 6B, if the third switching device **S2** and the first switching device **S1** are turned on, the second DC voltage stored in the battery **1000** may be converted into an AC voltage, and the converted AC voltage may be supplied to the grid via the second connector **805** as the first output AC voltage.

[0101] As shown in FIG. 6C, if the first switching device **S1** and the third switching device **S3** are turned on, the AC voltage from the grid may be converted into a DC voltage, and the converted DC voltage may be supplied to the battery **1000** via the fourth connector **807**.

[0102] Next, FIGS. 6D to 6F illustrate operation of the power conversion device **800** performed when grid power outage occurs or the grid is unstable.

[0103] As shown in FIG. 6D, if the fifth switching device **S5** and the second switching device **S2** are turned on when grid power outage occurs, the input AC voltage may be output to the third connector **851** as the second output AC voltage.

[0104] Thereby, when the plug of the home appliance **900a** is connected to the third connector **851**, the home appliance **900a** may be driven by the power supply device **800**.

[0105] If grid power outage occurs while the first output AC voltage based on the input AC voltage is output to the grid, the controller **870** may control the first output AC voltage, which is based on the input AC voltage, not to be supplied to the grid, and control the input AC voltage to be output to the third connector **851** as the second output AC voltage, as shown in FIG. 6D.

[0106] Thereby, the input AC voltage generated by, for example, a solar module may be utilized when grid power outage occurs.

[0107] In particular, if the plug of the external electronic device is connected, the input AC voltage may be output to the third connector **851** as the second output AC voltage. Thereby, the external electronic device may be stably operated even if grid power outage occurs.

[0108] If the peak value of the input AC voltage is greater than or equal to a first peak value while grid power outage occurs and the plug of an external electronic device is connected to the third connector **851**, the controller **870** may control the input AC voltage to be output to the third connector **851** as the second output AC voltage, as shown in FIG. 6D.

[0109] If grid power outage occurs, the controller **870** may control the power generator **820** to generate an AC voltage waveform in order to continuously receive the input AC voltage.

[0110] Next, as shown in FIG. 6E, if the fifth switching device **S5** and the third switching device **S3** are turned on when grid power outage occurs, the input AC voltage may be converted into a DC voltage and the converted DC voltage may be supplied to the battery **1000** via the fourth connector **807**.

[0111] If grid power outage occurs while the first output AC voltage based on the input AC voltage is output, the controller **870** may control the first output AC voltage based on the first information not to be supplied to the grid, and